

## WHAT IS CLAIMED IS:

- 1           1.     A lithographic method, comprising:  
2           aligning a patterned mold with respect to an alignment mark disposed on a  
3           substrate based upon interaction of a scanning probe with the alignment mark.
- 1           2.     The method of claim 1, wherein the patterned mold is aligned based  
2           upon detection of a tunneling current between the scanning probe and the alignment  
3           mark.
- 1           3.     The method of claim 1, wherein the patterned mold is aligned based  
2           upon detection of an interaction force generated between the scanning probe and the  
3           alignment mark.
- 1           4.     The method of claim 1, further comprising moving a probe near the  
2           alignment mark.
- 1           5.     The method of claim 4, wherein the probe is moved near the alignment  
2           mark by optical alignment.
- 1           6.     The method of claim 4, further comprising applying a voltage between  
2           the probe and the alignment mark to induce a tunneling current between the probe  
3           and the alignment mark.
- 1           7.     The method of claim 4, wherein the probe has a fixed spatial position  
2           relative to the patterned mold.
- 1           8.     The method of claim 4, wherein the probe is carried on the patterned  
2           mold.
- 1           9.     The method of claim 1, further comprising urging the aligned mold into  
2           a film disposed on the substrate to transfer a relief pattern to the film.
- 1           10.    The method of claim 7, further comprising exposing thinned regions of  
2           the transferred relief pattern.

1           11.    A device formed by a lithographic method, comprising:  
2           aligning a patterned mold with respect to an alignment mark disposed on a  
3           substrate based upon detection of a tunneling current through the alignment mark.

1           12.    A lithographic system, comprising:  
2           a controller configured to align a patterned mold with respect to an alignment  
3           mark disposed on a substrate based upon interaction of a scanning probe with the  
4           alignment mark.

1           13.    The system of claim 12, further comprising a scanning probe alignment  
2           system configured to transmit to the controller position reference signals based upon  
3           detection of a tunneling current between the scanning probe and the alignment  
4           mark.

1           14.    The system of claim 12, further comprising a scanning probe alignment  
2           system configured to transmit to the controller position reference signals based upon  
3           detection of an interaction force generated between the scanning probe and the  
4           alignment mark.

1           15.    The system of claim 12, further comprising a scanning system  
2           configured to move the scanning probe near the alignment mark.

1           16.    The system of claim 15, further comprising an optical alignment system  
2           configured to cause the scanning system to position the probe near the alignment  
3           mark.

1           17.    The system of claim 15, wherein the scanning system is configured to  
2           retract the scanning probe to enable the patterned mold to be urged into a film  
3           disposed on the substrate to transfer a relief pattern to the film.

1           18.    The system of claim 12, wherein the controller is configured to cause  
2           the scanning system to urge the patterned mold into a film disposed on the substrate  
3           to transfer a relief pattern to the film.

1           19.    The system of claim 12, wherein the controller is configured to align  
2   the patterned mold in two or more different co-planar directions.

1           20.    A lithographic system, comprising:  
2           a mold having a patterned surface exposed for contact with and configured to  
3   be urged into a film disposed on a substrate to transfer a relief pattern to the film;  
4   and  
5           a probe configured to interact with a nearby alignment mark disposed on the  
6   substrate.

1           21.    The system of claim 19, wherein the probe is carried on the mold.